

WHAT IS CLAIMED IS:

1. An electrical connector comprising:

an insulative housing defining a receiving cavity; and

a contact insert being received in the receiving cavity of the insulative housing and including a plurality of electrical contacts comprising portions arranged in an upper and a lower levels, the electrical contacts being arranged into differential pairs, a first electrical contact of a first differential pair electrically coupling with a second electrical contact of the first differential pair while simultaneously electrically coupling with a first electrical contact of a second differential pair to balance an electrical coupling between the first electrical contact of the second differential pair and the second electrical contact of the first differential pair, a contacting portion of the first electrical contact of the second differential pair and a contacting portion of the second electrical contact of the first differential pair being adjacent to each other in one of the upper and lower levels.

2. The electrical connector as claimed in claim 1, wherein each of the electrical contacts comprises the contacting portion, a transitional portion and a tail portion and wherein the contacting portions extend from the one of the upper and lower levels.

3. The electrical connector as claimed in claim 2, wherein the transitional portions of the first and the second electrical contacts of the first differential pair are located in the upper and the lower levels, respectively.

4. The electrical connector as claimed in claim 2, wherein the transitional portions of the first and the second electrical contacts of the first differential pair are located in one of the upper and the lower levels.

5. The electrical connector as claimed in claim 2, wherein the contact insert comprises an insulative portion in which the electrical contacts are insert molded,

the insulative portion comprising a horizontal portion beyond which the contacting portions extend and a vertical portion perpendicular to the horizontal portion beyond which the tail portions extend.

6. The electrical connector as claimed in claim 2, wherein the transitional portion of the first electrical contact of the first differential pair is a generally U-shaped plate located in the upper level and the transitional portion of the second electrical contact of the first differential pair is generally U-shaped located in the lower level to vertically align with the transitional portion of the first electrical contact of the first differential pair.

7. The electrical connector as claimed in claim 2, wherein the transitional portions of the first and a second electrical contacts of the second differential pair are located in the upper and the lower levels, respectively, and each comprise a rectangular plate section vertically offset from each other.

8. The electrical connector as claimed in claim 2, wherein the transitional portions of the first and a second electrical contacts of the second differential pair are located in one of the upper and the lower levels and each comprise a rectangular plate section and a U-shaped section and wherein the rectangular plate section of the first electrical contact are substantially surrounded by the U-shaped section of the second electrical contact while the U-shaped section of the first electrical contact substantially surrounds the rectangular plate section of the second electrical contact.

9. The electrical connector as claimed in claim 2 further comprising a third differential pair spaced from the first differential pair by the first electrical contact of the second differential pair and wherein the transitional portions of a first and a second electrical contacts of the third differential pair are located adjacent to each other in one of the upper and the lower levels and each comprise an outwardly and

laterally extending rectangular plate section.

10. An electrical connector comprising:

an insulative housing defining a receiving cavity; and

a plurality of electrical contacts accommodated in the receiving cavity of the insulative housing, each electrical contact comprising a contacting portion, a tail portion extending beyond the insulative housing and a transitional portion connecting the contacting and the tail portions, the transitional portion of a first electrical contact of the plurality of electrical contacts being located in a first horizontal plane and the transitional portions of a second, a third and a fourth electrical contacts of the plurality of electrical contacts being located in a second horizontal plane in parallel proximity to the first horizontal plane, the first and the second electrical contacts and the third and the fourth electrical contacts respectively forming a differential pair, a first electrical coupling between the second and the third electrical contacts being balanced by a second electrical coupling between the first and the third electrical contacts.

11. The electrical connector as claimed in claim 10, wherein the plurality of electrical contacts are insert molded in an insulative portion to form a contact insert received in the receiving cavity of the insulative housing, the insulative portion comprising a horizontal section in which the transitional portions of the electrical contacts are embedded and beyond which the contacting portions of the electrical contacts extend, and a vertical section perpendicular to the horizontal section and beyond which the tail portions of the electrical contacts extend.

12. The electrical connector as claimed in claim 10 further comprising a conductive shield enclosing the insulative housing.

13. An electrical connector comprising:

an insulative housing defining a receiving cavity; and

a first through eighth electrical contacts accommodated in the receiving cavity of the insulative housing, each of the first through eighth electrical contacts comprising a contacting portion arranged in a first to eighth side-by-side array, a tail portion extending beyond the insulative housing, and a transitional portion connecting the contacting portion and the tail portion, the transitional portions of the first, the fourth, the fifth and the eighth electrical contacts being located in a first horizontal plane from which the contacting portions of all of the eight electrical contacts extend and from which the tail portions of the first, the fourth, the fifth and the eighth electrical contacts extend, the transitional portions of the second, the third, the sixth and the seventh electrical contacts being located in a second horizontal plane parallel to the first horizontal plane.

14. The electrical connector as claimed in claim 13, wherein each of the transitional portions of the first and the eighth electrical contacts comprises a U-shaped plate section and each of the second and the seventh electrical contacts are generally U-shaped and are vertically overlapping the U-shaped plate sections of the first and the eighth electrical contacts.

15. The electrical connector as claimed in claim 14, wherein each of the transitional portions of the third and the sixth electrical contacts comprises a U-shaped section surrounded by the U-shaped sections of the second and the seventh electrical contacts, respectively and vertically overlapped by the U-shaped plate sections of the first and the eighth electrical contacts, respectively.

16. The electrical connector as claimed in claim 13, wherein each of the transitional portions of the third and the sixth electrical contacts comprises a U-shaped section and a rectangular plate section, the rectangular plate sections of the transitional portions of the third and the sixth electrical contacts extending into and surrounded by the U-shaped sections of the transitional portions of the sixth

and the third electrical contacts, respectively.

17. The electrical connector as claimed in claim 16, wherein each of the transitional portions of the fourth and the fifth electrical contacts comprises a rectangular plate section vertically aligned with the rectangular plate sections of the sixth and the third electrical contacts, respectively.

18. The electrical connector as claimed in claim 13, wherein the first to eighth electrical contacts are insert molded in an insulative portion and wherein the insulative portion comprises a horizontal section in which the transitional portions of the first to the eighth electrical contacts are embedded and from which the contacting portions of the first to the eighth electrical contacts extend, and a vertical section which is perpendicular to the horizontal section and from which the tail portions of the first to the eighth electrical contacts extend.

19. The electrical connector as claimed in claim 13 further comprising a conductive shield enclosing the insulative housing.

20. An electrical connector comprising:

an insulative housing defining a receiving cavity; and

a contact insert received in the receiving cavity of the insulative housing, the contact insert comprising an insulative portion and a plurality of electrical contacts, each electrical contact comprising a transitional portion insert molded in the insulative portion, a contacting portion extending from the transitional portion beyond the insulative portion into the receiving cavity of the insulative housing, and a tail portion extending from the transitional portion beyond the insulative portion of the contact insert and beyond the insulative housing, the transitional portions of a first and a second electrical contacts of the plurality of electrical contacts being located in a first horizontal plane and the transitional portions of a third and a fourth electrical contacts of the plurality of electrical contacts being

located in a second horizontal plane parallel to the first horizontal plane, the first and the third electrical contacts and the second and the fourth electrical contacts being arranged into a first and a second differential pairs, respectively, the first electrical contact of the first differential pair vertically aligning with the fourth electrical contact of the second differential pair to establish an electrical coupling therebetween to balance an electrical coupling between the third electrical contact of the first differential pair and the fourth electrical contact of the second differential pair which is located adjacent to the third electrical contact of the first differential pair.

21. The electrical connector as claimed in claim 20 further comprising a conductive shield enclosing the insulative housing.

22. The electrical connector as claimed in claim 20, wherein the insulative portion comprises a horizontal section from which the contacting portions of the electrical contacts extend and a vertical section perpendicular to the horizontal section, the tail portions of the electrical contacts extending beyond the vertical section.

23. An electrical connector comprising:

an insulative housing defining a receiving cavity for receiving a mating connector; and

a contact insert received in the receiving cavity of the insulative housing, the contact insert comprising a printed circuit board having conductive traces and a plurality of electrical contacts assembled to the printed circuit board, the electrical contacts having contacting portions extending into the receiving cavity of the insulative housing, the electrical contacts electrically connecting to the conductive traces of the printed circuit board, respectively;

the electrical contacts being electrically arranged into differential pairs;

a first conductive trace of the conductive traces that connects with a first electrical contact of a first differential pair extending over both a second conductive trace of the conductive traces that connects with a second electrical contact of the first differential pair and a first conductive trace of the conductive traces that connects with a first electrical contact of a second differential pair, wherein the second electrical contact of the first differential pair is adjacent to the first electrical contact of the second differential pair;

wherein an electrical coupling between the second conductive trace of the first differential pair and the first conductive trace of the second differential pair is balanced by an electrical coupling between the first conductive trace of the first differential pair and the first conductive trace of the second differential pair.

24. An electrical connector comprising:

an insulative housing defining a lengthwise direction and a transverse direction perpendicular to each other;

a plurality of conductors disposed in the housing, said contacts juxtaposed one another along the transverse direction of said housing with a tiny pitch between every adjacent two conductors;

each of said conductors defining a front mating section and a rear mounting section, and an intermediate section therebetween;

the intermediate section of said conductors arranged with at least first and second levels; wherein

the intermediate sections of a first conductor extends in both said transverse direction and said lengthwise direction to define a rectangle having a transverse dimension cross more than one pitch at the first level;

the intermediate section of a second conductor being not right next to but second next to said one conductor, extends in both said transverse direction and

said lengthwise direction to define another rectangle having another transverse dimension cross more than one pitch at the second level; and

the rectangle of the first conductor and the rectangle of the second conductor at least partially overlap with each other in a vertical direction perpendicular to both said lengthwise direction and said transverse direction, for initiating a coupling between the first conductor and the second conductor to somewhat counterbalance another coupling between the first conductor and a third conductor which is between the first conductor and the second conductor.

25. The connector as claimed in claim 24, wherein the intermediate section of the first conductor and the intermediate section of the second conductor are traces formed on at least one printed circuit board connected between the mating sections and the mounting sections of the first and the second conductors.

26. The connector as claimed in claim 24, wherein the said intermediate section of the first conductor is substantially positioned on one side of the first conductor, and the first conductor further includes another intermediate section on the other side thereof to couple with a fourth conductor for counterbalancing coupling between the first conductor and a fifth conductor which is positioned between the first conductor and the fourth conductor.

27. An electrical connector comprising:

an insulative housing defining a lengthwise direction and a transverse direction perpendicular to each other;

eight conductors disposed in the housing and numbered as 1 to 8 in sequence, said contacts juxtaposed one another along the transverse direction of said housing with a tiny pitch between every adjacent two conductors;

each of said conductors defining a front mating section and a rear mounting section, and an intermediate section therebetween;



the intermediate section of said contacts arranged with at least first and second levels; wherein

the intermediate sections of the contacts numbered 1, 4, 5 and 8 are located at the first level, and those of the contacts numbered 2, 3, 6 and 7 are located at the second level.

28. The connector as claimed in claim 27, wherein said intermediate sections at the first level are arranged symmetrical relative a center line thereof along said lengthwise direction.

29. The connector as claimed in claim 27, wherein said intermediate sections at the second level are arranged upside down symmetrical relative to a diagonal thereof.